

CLAIMS

1. A film forming system comprising a chamber, a precursory gas supplying line to supply the chamber with precursory gas, a reactive gas supplying line to supply the chamber with reactive gas, and a purge gas supplying line to supply purge gas that purges the precursory gas and the reactive gas, and that forms a thin film on a substrate in the chamber by supplying the precursory gas or the reactive gas and purging alternately, wherein further comprising a middle line having a certain volume that is arranged on a part or all of the precursor supplying line and into which the precursory gas can be filled at a time when the precursory gas is not supplied, and/or a middle line having a certain volume that is arranged on a part or all of the reactive gas supplying line and into which the reactive gas can be filled at a time when the reactive gas is not supplied.
2. The film forming system described in claim 1, wherein a switching valve is arranged on an inlet port and an outlet port of the middle line respectively so as to specify a volume of the middle line with the cross-sectional area of a line body constituting the middle line and a distance between each of the switching valves.
- 25 3. The film forming system described in claim 2, wherein the switching valve is a three-way valve.
4. The film forming system described in claim 1, wherein

the purge gas supplying line is connected to the precursory gas supplying line to which the middle line is arranged and/or the reactive gas supplying line to which the middle line is arranged and the precursory gas and/or the reactive gas each of which is filled in the middle line is supplied to the chamber by pushing out the precursory gas and/or the reactive gas by the use of the purge gas.

5. The film forming system described in claim 1, wherein
10 the precursory gas and/or the reactive gas is supplied to the chamber in 0.1 through 2 second.

6. The film forming system described in claim 1, wherein a concentration adjusting device to adjust each concentration 15 of the precursory gas and the reactive gas is connected to the precursory gas supplying line and the reactive gas supplying line respectively and each concentration adjusting device adjusts each concentration of the precursory gas and the reactive gas so as to supply each gas at more than or 20 equal to 0.15×10^{-6} mol/cm² with respect to an area of the substrate on which the thin film is formed.

7. The film forming system described in claim 1, wherein each of the precursory gas supplying line and the reactive 25 gas supplying line is independently connected to the chamber.

8. The film forming system described in claim 1, and that is arranged to purge the chamber so that each concentration

of the precursory gas and/or the reactive gas becomes less than or equal to 1/1000 in less than or equal to 2 seconds.

9. A film forming method that makes use of a chamber, a precursory gas supplying line to supply the chamber with precursory gas, a reactive gas supplying line to supply the chamber with reactive gas, and a purge gas supplying line to supply purge gas that purges the precursory gas and the reactive gas and that forms a thin film on a substrate in the chamber by supplying the precursory gas or the reactive gas and purging alternately, wherein a middle line having a certain volume is arranged on a part or all of the precursor supplying line and the precursory gas is filled into the middle line at a time when the precursory gas is not supplied, and/or a middle line having a certain volume is arranged on a part or all of the reactive gas supplying line and the reactive gas is filled into the middle line at a time when the reactive gas is not supplied.